

CLAIMS

What is claimed is:

1. A device for balanced high speed submarine gel electrophoresis, comprising:

a base, made liquid impermeable for holding buffer of electrophoresis, having a bottom in substantially rectangular shape with a base length between two end walls and a base width between two longitudinal walls, being accessible from top;

a gel matrix, on top of said bottom around middle region, in a substantially rectangular shape with a first gel end, a second gel end, and a plurality of sample wells in parallel with said first gel end, being capable of resolving sample mixture into distinguishable bands under action of an external power applied via connections of electrodes, connectors, and wires;

a first piece, being capable of engaging with said two longitudinal walls and said gel matrix at a first location adjacent to said first gel end and in parallel with said first gel end substantially;

a second piece, being capable of engaging with said two longitudinal walls and said gel matrix at a second location adjacent to said second gel end in parallel with said second gel end substantially;

a balancing chamber, defined by said first piece, said second piece, said two longitudinal walls, and said gel matrix, minimizing inflow of said buffer over said gel matrix;

a balancing liquid, held within said balancing chamber on top of said gel matrix, containing conductive ions at user adjustable concentration, conducting electric current to generating heat for temperature elevation and minimizing vertical temperature gradient of said gel matrix;

a cooling structure, having a thermal wall thick enough to slow down heat absorption, contacting said balancing liquid for thermal communication, and

a coolant, held inside said cooling structure and isolated from said balancing liquid, absorbing heat from said balancing liquid and said gel matrix via said thermal wall.

1 2. The device as claimed in claim 1 wherein said balancing liquid has ion concentration at a level
2 of 30% of the ion concentration of said gel matrix.
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